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Parameter	Value	Unit
Temperature	25.0	°C
Pressure	1.0	atm
Flow rate	1.0	L/min
Concentration	0.1	mol/L
pH	7.0	
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.1	

1 may be difficult to clean. The fact that such feeders are generally larger and heavier
2 than non-selective feeders makes refilling and cleaning more cumbersome as well.

3 There remains a need in the art for an improved selective bird feeder.
4

5 SUMMARY

6 The present invention is directed to a selective feeder, preferably a selective
7 bird feeder. The selective feeder includes a selective housing having a sidewall and
8 a base. A cover is supported by the sidewall of the selective housing, and a seed holder
9 is contained within the selective housing. In some embodiments, the seed holder is
10 supported on the base. In other embodiments, the selective housing is supported on
11 the base. Both the seed holder and the selective housing may in some embodiments
12 be attached to the base.

13 In another embodiment, the selective feeder includes a selective housing
14 having a cylindrical sidewall and including apertures having a width ranging from
15 about 1.3 inches to about 1.7 inches. A removable cover is supported on the
16 cylindrical sidewall of the selective housing. A cylindrical seed holder is contained
17 within and spaced apart from the cylindrical sidewall of the selective housing. A
18 hanger may be hanger attached to the selective bird feeder. The removable cover may
19 be in direct contact with the cap of the cylindrical seed holder and the sidewall of the
20 selective housing. Alternatively, the removable cover may be in direct contact with
21 the cylindrical seed holder and the sidewall of the selective housing while being
22 spaced apart from the cap of the cylindrical seed holder.

23 In another embodiment, the selective bird feeder includes a selective housing
24 having at least one sidewall and a base. At least one sidewall of the selective housing
25 includes a plurality of apertures. A seed holder is at least partially contained within
26 the selective housing and supported by the base of the selective housing. A space is
27 disposed between a sidewall of the seed holder and the at least one sidewall of the
28 selective housing. A removable top is in direct contact with the seed holder and
29 supported by the at least one sidewall of the selective housing. The removable top

1 includes an aperture through which a portion of the seed holder extends. The seed
2 holder further includes a cap spaced apart from the removable top. The seed holder
3 further includes a hanger attached to the cap.

4 In some embodiments, the cover is maintained in fixed relation to the selective
5 housing using a suitable device positioned above the cover. The device may be a
6 spring clip, a clamp and nut assembly, an annular rib formed in the seed housing, or
7 other suitable equivalents known to those of skill in the art.

8 In some embodiments, the cover is supported by a device positioned below the
9 cover. The device may be a spring clip, a clamp and nut assembly, or an annular rib
10 formed in the seed housing, or other suitable equivalents known to those of skill in the
11 art.

12 In some embodiments, the cover may be supported and maintained in fixed
13 relation to the selective housing and the cap of the seed holder using suitable devices
14 positioned above and below the cover. The devices may be spring clips, clamp and
15 nut assemblies, or annular ribs formed in the seed housing, or other suitable
16 equivalents known to those of skill in the art, used alone or in combination. In the
17 present embodiment, an annular rib is generally used in conjunction with another
18 removable device to facilitate removal of the cover.

21 BRIEF DESCRIPTION OF THE DRAWINGS

22 It should be understood that the drawings are provided for the purpose of
23 illustration only and are not intended to define the limits of the invention. The
24 foregoing and other features of the embodiments described herein will become
25 apparent with reference to the following detailed description when taken in
26 conjunction with the accompanying drawings in which:

27 FIG. 1 is a perspective view of one embodiment of a selective bird feeder in
28 assembled relation;

29 FIG. 2 is an exploded view of the selective bird feeder of FIG. 1;

1 FIG. 3 is a perspective view of the seed holder of the selective bird feeder of
2 FIG. 1;

3 FIG. 4. is a perspective view of the selective housing of the selective bird
4 feeder of FIG. 1;

5 FIG. 5 is a perspective view of one embodiment of a cover for the selective
6 bird feeder of FIG. 1;

7 FIG. 5A is a perspective view of another embodiment of a cover for the
8 selective bird feeder of FIG.1;

9 FIG. 5B is an expanded perspective view of the cover of FIG. 5 positioned on
10 the selective housing of the feeder of FIG. 1;

11 FIG. 5C is an expanded side view of the cover of FIG. 5 positioned on the
12 selective housing of the feeder of FIG. 1;

13 FIG. 6A is a schematic top view of the base of the selective bird feeder of
14 FIG. 1;

15 FIG. 6B is an expanded perspective view showing the selective housing and
16 base in assembled relation;

17 FIG. 6C is an expanded side view showing the selective housing and base in
18 assembled relation;

19 FIG. 7 is a side view of the selective bird feeder of FIG. 1 in assembled
20 relation;

21 FIG. 7A is an expanded side view of the selective bird feeder of FIG. 1,
22 showing how ht base, selective housing, and cover may be removed from the seed
23 holder by removing the fastener from the base;

24 FIG. 8 is a perspective view of another embodiment of a selective bird feeder
25 in assembled relation;

26 FIG. 9 is a perspective view of a device used to maintain a cover in fixed
27 relation to the selective housing;

FIG. 10 is an expanded perspective view of a feeder including the device of FIG. 9, and showing the cover engaged with the selective housing and with the device positioned adjacent to and above the cover;

FIG. 11 is an expanded schematic side view of the feeder of FIG. 10;

FIG. 12 is an expanded side view of the feeder of FIG. 10 showing the cap of the seed holder in a closed position and showing the cover in fixed relation to the selective housing with the locator tabs engaged with the selective housing;

FIG. 13 is an expanded side view of the feeder of FIG. 10 showing the cap in an open position for adding seed to the seed holder, and showing the cover remaining in fixed relation to the selective housing;

FIG. 14 is a schematic of an alternative device used to maintain the cover in fixed relation to the selective housing; and

FIG. 15 is a schematic illustration of a seed holder cylinder having an annular rib on which a dome is supported, and including the device of FIG. 9 positioned above the cover.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

One embodiment of a selective feeder 10 is illustrated with reference to FIGS. 1-7A.

Selective feeder 10 is shown in assembled relation in perspective view in FIG. 1. As shown in an exploded view in FIG. 2, selective feeder 10 includes a seed holder 12, a cover 14, a selective housing 16, and a base 18, which together define an interior space 20 (FIG. 1). Selective housing 16 includes a side wall 22 and opposing upper and lower edges 24, 26. In some embodiments, seed holder 12, selective housing 16, or both, may be fastened to base 18, which may necessitate the use of a fastening device 28. Selective housing 16 may be fastened to base 18 using, for example, wire.

Seed holder 12 is illustrated in greater detail in FIG. 3. Seed holder 12 includes a base 30, a seed baffle 32 and a seed housing 34 that together define a

1 compartment 36 for containing, for example, bird seed. Seed housing 34 is illustrated
2 herein as a substantially cylindrical tube having a length "l" and a diameter "d" that
3 may vary as desired in order to accommodate different situations. For example, when
4 it is desired to minimize the number of times required to refill the seed holder, the
5 diameter, length, or both, of seed holder 12 may be increased, limited only by
6 practical considerations such as, for example, the weight of the selective bird feeder.
7 Seed housing 34 includes at least one aperture 38 through which selected birds may
8 access seed that may be contained therein. Optional baffles (not illustrated) and
9 perches 40 may be included, many types of which are well known in the art.

10 Base 30 and seed baffle 32 are exemplary only, and may be replaced or
11 substituted for other configurations that are well known in the art. However, base 30
12 and seed baffle 32 may be separate pieces, although illustrated herein as an integral
13 unit. Moreover, use of seed baffle 32 is not required.

14 In some embodiments, seed holder 12 may include a cap 42 for protecting seed
15 contained therein from animals or the elements. Alternatively, cover 14 may be
16 substituted for cap 42 and disposed directly on seed housing 34 to achieve the same
17 result.

18 As shown, seed holder 12 may also include a hanger 44 to facilitate suspension
19 of selective feeder 10 from a tree, a pole, or the like. Any type of hanger may be used
20 with the selective feeder, attached to any part of the selective feeder, if desired. The
21 present embodiment includes an exemplary hanger 44 that includes a bail rod 46
22 extending through seed housing 34 and a bail wire 48 connected to opposing ends of
23 bail rod 46. The present exemplary hanger 44 is preferred because it allows ease of
24 refilling seed housing 34, as described in greater detail below. However, any type of
25 hanger that allows the seed holder 12 to be refilled without removing cover 14 is
26 preferred.

27 As stated previously, interior space 20 is defined by seed holder 12, cover 14,
28 selective housing 16, and base 18. Interior space 20 has a width "w" determined by
29 the distance between seed housing 34 and selective housing 16. The only constraint

1 on the width "w" of interior space 20 is that the entire interior space 20, or at least a
2 portion of interior space 20, must have a width "w" sufficient to allow the selected
3 birds to enter and move freely therein. Therefore, a selected bird may enter interior
4 space 20 through selective housing 16 to feed from the seed holder 12. In the present
5 embodiment, in which seed holder 12 and selective housing 16 are both illustrated as
6 having substantially cylindrical shapes, interior space 20 has a constant width "w"
7 extending from base 20 to the top edge 24 of selective housing 16. However, the
8 illustrated cylindrical shapes are not required; seed holder 12 and selective housing 18
9 may vary in shape or size, such that at least a portion of interior space 20 has a width
10 "w" that is sufficient to allow the selected birds to enter and move freely therein.
11 Therefore, "w" may be any width, but in preferred embodiments, width "w" may
12 range from about one inch to about three inches, more preferably about one and one-
13 half inches.

14 As shown in greater detail in FIG. 4, selective housing 16 includes a least one
15 side wall 22 and opposing upper and lower edges 24, 26. Selective housing 16 is
16 illustrated herein as a substantially cylindrical tube having a length "l" and a diameter
17 "d" that will vary in accordance with the length and diameter of seed housing 34 in
18 order to maintain a sufficient width "w" of interior space 20. At least one selective
19 aperture 50 may be disposed in sidewall 36, although many more may be included, as
20 illustrated herein. Aperture 50 is dimensioned to allow access to interior space 20 by
21 selected birds. In one embodiment, the selected birds are songbirds, which typically
22 are able to pass through openings having a minimum dimension of about 1.5 inches.
23 For example, the minimum dimension for circular apertures is the diameter of the
24 circle; the minimum dimension of square apertures is the length of one side; the
25 minimum dimension of rectangular apertures is the length of the shortest side, and so
26 on. Aperture 50 of side wall 22 may have any selected dimension desired in order to
27 provide access by birds of a selected dimension. Moreover, apertures of different
28 shapes may be included, provided the minimum dimension is sufficiently small to
29 restrict access by the non-selected birds.

FIG. 5 is an expanded perspective view of cover 14, which includes upper and lower edges 52,54 and interior and exterior surfaces 56,58. Interior surface 56 preferably includes a plurality of locator tabs 60 to assist with positioning cover 14 on selective housing 16. Cover 14 may be any shape or size provided that it extends beyond selective housing 16 in order to limit access by squirrels to selective housing 16. Cover 14 preferably slopes downwardly away from seed holder 12 in order to afford the greatest protection from the elements and to minimize squirrels' ability to brace or support themselves on selective feeder 10. Thus, in the present embodiment, cover 14 is illustrated as dome-shaped and having a diameter larger than the diameter "d" of selective housing 16. The amount by which the cover 14 extends beyond selective housing may be reduced or minimized as the width of interior space 20 increases.

In some embodiments, and as illustrated herein, cover 14 includes a centrally disposed aperture 62 configured to allow cover 14 to be slidably received on seed housing 34 of seed holder 12. Thus, cover 14 is spaced apart from cap 42 of seed holder 12 in the present embodiment, and a portion of seed housing 34 extends through aperture 62. In this embodiment, cover 14 is directly in contact with seed housing 34. In one embodiment, cover 14 may include apertures 30, as described above with reference to side wall 36. In yet another embodiment, cover 14 may be integrally formed with seed housing 28.

In preferred embodiments, exterior surface 58 is preferably substantially smooth and free of any surface or depression that would provide a grasping spot for squirrels and the like. Thus, providing a substantially smooth exterior surface 58 eliminates leverage that such animals might otherwise have to remove cover 14 to access seed. By providing a smooth exterior surface 58, animals are more likely to slide off than to gain leverage. In one embodiment, cover 14 may be substantially smooth and solid and formed from, for example, a transparent material such as polycarbonate. When cover 14 is substantially solid, it also provides protection from rain or dung, protecting both birds and seed contained within space 20 from becoming

1 wet or contaminated. When cover 14 is transparent, viewers may also view birds in
2 space 20 more easily from many different viewing angles.

3 FIG. 5A is an expanded perspective view of another embodiment of a
4 cover 15, in which like numbers designate like elements. Cover 15 differs from
5 cover 14 by the amount of downward slope. That is, the downward slope of cover 15
6 is less than that of cover 14.

7 The assembled relation of cover 14 in assembled relation with seed holder 12
8 and selective housing 16 is shown in expanded perspective and side view in FIGS. 5B
9 and 5C. As shown, cover 14 is slidably received on seed housing 34 and positioned
10 on selective housing 16 using locator tabs 60, which engage with upper edge 24 of
11 selective housing 16. Bail rod 46 extends through seed housing 34, cap 40 is disposed
12 over seed housing 34, and bail wire 48 is connected to bail rod 46 at opposing ends.

13 FIG. 6 is an expanded top view of base 18, which preferably includes a
14 flange 64 disposed around the perimeter of base 18 into which selective housing 16
15 is slidably receivable. Although not required, in some embodiments, base 18 includes
16 a central aperture 66 through which, for example, fastener 28 may be used to attach
17 to base 18 to base 30 of seed holder 12. However, base 30 of seed holder 12 may rest
18 on base 18 without attachment thereto, provided that base 18 is attached to selective
19 housing 16. If desired, drainage apertures 68 may also be provided to prevent water
20 or other substances from collecting therein. In preferred embodiments, one or both
21 of seed holder 12 and selective housing 16 may be attached to base 18, as described
22 above (for example, with wire twists or wire clips). In order to facilitate such
23 attachment, receiving apertures 70 may be disposed in base 18 as well.

24 Base 18 provides support for selective housing 16 and seed holder 12. As with
25 seed holder 12 and selective housing 16, base 18 may vary in shape and size. Base 18
26 has a diameter "d" that will vary in accordance with the diameter of the selective
27 housing 16 in order support selective housing 16 and to maintain a sufficient width
28 "w" of interior space 20. Thus, in the present embodiment, base 18 is illustrated as
29 substantially round to accommodate the cylindrical shape of selective housing 16 and

1 seed holder 12. Base 18 preferably slopes inwardly toward seed holder 12 to prevent
2 dropped seeds from falling to the ground.

3 Suitable materials for base 18 include substantially solid materials such as
4 plastic or metal. Transparent plastics are preferred due to the ease of viewing interior
5 space 20 that is provided from many viewing angles. One preferred plastic material
6 is polycarbonate. It is not necessary that base 18 be solid. Thus, in one embodiment,
7 base 18 may include apertures 50, as described above with reference to side wall 22.
8 In yet another embodiment, base 18 may be integrally formed with side wall 22.
9 Base 18 may also include an axially disposed boss member (not illustrated) extending
10 upwardly on which to fix the position of seed holder 12 and to prevent seed holder 12
11 from moving freely around on base 18.

12 The assembled relation of base 18 with seed holder 12 and selective
13 housing 16 is shown in expanded perspective and side view in FIGS. 6B and 6C. As
14 shown, lower edge 26 of selective housing 16 is slidably received in flange 64 of
15 base 18. Base 30 of seed holder 12 may be centrally disposed and connected to
16 base 18 using fastener 28. Selective housing 16 may be attached to base 18 via
17 fasteners 65 threaded through apertures 70.

18 FIG. 7 is a schematic side view of selective bird feeder 10 in an assembled
19 relation. In the present embodiment, seed holder 12 is supported on base 18 and
20 attached thereto using fastener 22. In the present embodiment, fastener 22 is
21 illustrated as a threaded plug, although those of skill in the art will recognize that other
22 equivalent devices may be used. Also in the present embodiment, selective
23 housing 16 is supported on base 18 and attached thereto by fasteners 65. Cover 14
24 is slidably received on seed housing 34 and supported on sidewall 36, where it is
25 positioned by locator tabs 42. Seed holder 12 extends through aperture 62 of
26 cover 14. Cap 40 is disposed over seed housing 34. Hanger 44 is attached to seed
27 housing 24, as described above.

28 FIG. 8 illustrates another embodiment of a selective feeder 72 using cover 15
29 in place of cover 14.

FIG. 9 illustrates a device 74 that may be positioned on seed housing 34 above or below cover 14,15. Device 74 maintains cover 14,15 in substantially fixed relation to cap 40 and the upper edge 24 of side wall 22. When positioned above cover 14,15, device 74 prevents squirrels from lifting or removing the cover to access the birdseed contained within seed holder 12. Although illustrated herein as a spring clip, device 74 may be any device known to those of skill in the art that will accomplish the same result.

As shown in FIG. 14, device 74 may be a clamp that may be secured around seed housing 34 using a wing nut or the like. In another embodiment, device 74 may be an annular rib (not illustrated) integrally formed in seed housing 34, below which cover 14 may be positioned while supported on side wall 36 of selective housing 18. An annular rib positioned above cover 14,15 will function in the same manner as the spring clip or the clamp. In order to eliminate having to remove cover 14,15 when cleaning the selective housing 16 or base 28, a spring clip or clamp may be placed below cover 14,15 when used with annular rib.

In other embodiment shown in FIG. 15, an annular rib 76 may be disposed around seed housing 34 for supporting cover 14,15 in conjunction with device 74 positioned above cover 14,15.

It will be understood that various modifications may be made to the embodiments disclosed herein. The size and configuration of the bird feeder may be different. For example, although illustrated herein as cylindrical, the seed holder and selective housing may be, for example, square, oval, or any other shape and size. Although illustrated herein as a wire cage, the selective housing may be any material that allows the formation of apertures therein, for example, polycarbonate. Moreover, the size, shape, and quantity of the apertures in the selective housing may be greater or smaller, depending, for example, on the size of the selected animal. The cover of the selective housing may also have any shape or size. These and other changes can be made in the selective feeder provided the functioning and operation thereof are not adversely affected. Therefore, the above description should not be construed as

3 What is claimed is: